Environmental Knowledge and Awareness as a Key Driver of Green City Strategy: A Case Study of Malang City

Galang Fairuz Reksa Ashfahani[1*], Moh. Khusaini[1], Bunga Hidayati[1]

[1] Postgraduate School, University of Brawijaya, Malang, Indonesia.

Abstract: This study aims to analyze the institutional and government readiness and identify the strengths, weaknesses, opportunities, and threats along with strategies to realize a green city in Malang City. Qualitative research methods in the form of SWOT analysis were used by involving informants from the State Civil Apparatus at the Regional Development Planning Agency and the Environmental Service of Malang City. The results of the study indicate that the institutional in Malang City is still weak, marked by the absence of a multidisciplinary working group for a green city. In addition, government readiness is still low due to lack of concern, a conventional "business as usual" work system, and weak law enforcement. Recommended strategies include the formation of a multidisciplinary working group, increasing green knowledge and awareness through green campaigns, circular economy, information transparency, and the implementation of rewards and punishments. Environmental awareness and high commitment from the government and collaboration between stakeholders are requirements to realize a Green City in Malang City.

Keywords: Environmental awareness; Environmental knowledge; Government readiness; Green city strategy; Institution

Introduction

Urbanization, characterized by population and industrial growth resulting from the Industrial Revolution, has impacted regional economic growth and human well-being (Chai et al., 2021). Cities provide jobs and contribute 80% to global GDP (Xu et al., 2021). This is a unique attraction for people to live in urban areas.

Approximately two-thirds or 68% of the world's population is expected to live in urban areas by 2050 with a population of more than 2.5 billion people (United Nations, 2019). Urbanization plays a crucial role in maintaining environmental sustainability because it can cause environmental changes, increase resource consumption, and influence urban planning patterns (Chai et al., 2021). Although urban areas cover only 3% of the earth's surface, energy consumption reaches 60%-80%, producing three-quarters of greenhouse gas emissions, as well as land cover changes (Xu et al., 2021)

that can damage natural systems, including agriculture, climate, freshwater, energy supplies, and biodiversity (Hall & Balogh, 2019).

Urban environmental issues are the most serious issues that will be faced internationally in the coming decades, so this topic will become increasingly important (Chai et al., 2021; Hall & Balogh, 2019). Urban Nature is increasingly seen as a sustainable alternative for urban design and development through a number of concepts such as garden cities, green belts, green infrastructure, Ecosystem-Based Adaptation (EBA), to Nature-Based Solutions (NBS) (Dorst et al., 2019). The development of NBS began with the desire to find innovative ways to manage natural systems that benefit nature and society by working with nature, not against it, in order to produce solutions such as resilient cities, resource-efficient cities, and green economies (Sowińska-Świerkosz & García, 2022). One example of the application of Nature-based solutions (NBS) in

development is Green City (European Commission, 2015).

Green City strategic planning is a series of actions taken simultaneously to meet the needs of sectors, including sustainable energy, sustainable mobility, disaster risk assessment and recovery, universal design, nature revitalization, waste management, water management, cultural heritage, and sustainable buildings and infrastructure (Dall'O', 2020). However, the development and planning of "ecological cities" in some countries do not meet international standards, due to weak planning and management, minimal public participation mechanisms, and the ecological city evaluation index system is still not dynamic (Li & Zhuang, 2023). Even developing countries, including Southeast Asia, have not yet adopted the green city concept in their development process (Kooy et al., 2020; Shackleton et al., 2021).

Indonesia is the largest country in Southeast Asia and one of the world's largest polluters. However, the implementation of green cities in Indonesia has not been optimal, as it is still limited to the construction of parks (Zain et al., 2022). Green city planning is a primary task for local governments, involving all relevant stakeholders and a number of necessary experts (Dall'O', 2020). However, only a small number of cities in Indonesia have implemented green city principles (Rostin et al., 2023).

Malang, the second largest city in East Java, faces the same problems as other cities in Indonesia due to urbanization, such as environmental degradation, flooding, traffic congestion, infrastructure problems, and slums. Rapid growth of built-up areas, population growth, and expansion of development can exceed the carrying capacity of the area faster than it should, which drives the need for sustainable development in Malang City (Subadyo et al., 2019).

Government readiness is a crucial factor in realizing sustainable development (Novita et al., 2024). In this case, law enforcement in Malang City for spatial and environmental matters is still weak (Wikantiyoso et al., 2020). Urban planning in Malang is still horizontal, due to the absence of regulations supporting the use of multifunctional buildings, and the absence of planning or implementation of a number of policies that support the implementation of a green city (Subadyo et al., 2019). Meanwhile, institution in the planning and budgeting process in Malang City are still not pro-community. The Malang City Government dominates and limits community involvement in the planning and budgeting process (Salahudin et al., 2017). Therefore, this study aims to analyze the institutional and government readiness, as well as the strengths, weaknesses,

opportunities, threats, and establish a strategic framework for realizing a green city in Malang City.

Method

Qualitative research methods are used in this study to understand and explore the process of formulating and implementing green city policies in Malang City. To provide information that is in accordance with research needs, the sampling technique uses purposive sampling, which is a sampling technique with certain considerations (Sugiyono, 2017). Key informants in this study were the Head of the Malang City Regional Development Planning Agency, the Head of Planning, Control, and Evaluation, and an associate planner. Meanwhile, supporting informants consisted of several senior planners, junior planners, and planning analysts who worked at the Malang City Regional Development Planning Agency, as well as analysts who worked at the Malang City Environmental Service. Deep interviews were conducted to obtain important and in-depth information related to institution, government readiness, opportunities, threats, and recommendations for green city policies in Malang City.

The most frequently used strategic planning technique is SWOT (Abdel-Basset et al., 2018). Adopting research conducted by Zhang et al. (2018), several steps taken in conducting a SWOT analysis include (1) identification of strengths, weaknesses, opportunities, and threats derived from literature reviews, government reports, and semi-structured interviews. In this study, identification was only carried out by interviewing 9 experts who were State Civil Apparatus/ Aparatur Sipil Negara (ASN) in charge of planning. (2) classification of strengths, weaknesses, opportunities, and threats based on the results of semi-structured interviews. (3) development of strategies based on SWOT mapping that has been verified by experts. In this study, strategies were obtained from expert recommendations during interviews.

Result and Discussion

Institution are Still Weak and here are no Multidisciplinary Working Groups

The success of a green city depends on institutional capacity, community participation, and innovation in financing green city programs (Szyja, 2019). The Malang City Government has several working groups consisting of several Regional Apparatuses in supporting environmental programs. Generally, these working groups are formed due to top-down policies from the Central Government that must be implemented by the Regional Government, not based on the initiative of the Malang City Government itself. Thus, in its

implementation, the working group in the environmental sector is still not running optimally.

The senior planner in charge of infrastructure said that there is a Housing and Settlement Area Working Group/ *Kelompok Kerja Perumahan dan Kawasan Permukiman* (Pokja PKP) that supports the realization of a green city in Malang City. This working group was formed based on the mandate of the Regulation of the Minister of Public Works and Public Housing Number 12 of 2020. The members of the PKP working group consist only of several Regional Apparatus in Malang City, without any involvement from other stakeholders. Meetings are often held when there is a certain urgency, such as the need to fulfill the completeness of the Special Allocation Fund application. Meanwhile, there are still no routine meetings to discuss strategies or evaluations.

The senior planner in charge of regional affairs also said that around 2015, there was a program from the Ministry of Public Works, namely the Green City Development Program/ *Program Pembangunan Kota Hijau* (P2KH), which encouraged the Regency/City Government to apply eight green principles in the city development process. At this time, the relationship between the Government and the green community was very good and there were intense discussions in discussing the planning and design of city development that prioritized sustainable principles. However, currently, this program is not continuing, and the relationship between the government and the green community is not as harmonious as before. In fact, the green community that used to be active in criticizing environmental conditions in Malang City is no longer so.

Meanwhile, in Malang City, there are several green communities whose members are still active, although not optimal. Green communities in Malang City include environmental cadres, waste banks (up to the RW level), Adiwiyata schools, etc. One of the leaders at Bappeda said that green communities in Malang City are active in environmental issues. Green communities often move on their own initiative when there are problems such as flooding, to help the government clean up trash/dirt in the river. The associate planner also believes that green communities in Malang City can be used as assets or advantages, because not all areas have them.

In addition, although not yet massive, several areas in Malang City have also carried out activities that support the creation of a green city. According to a senior planner in charge of regional affairs, there are several community actions that have shown environmental concern that can be seen from community proposals in the Development Planning Deliberation/ *Musyawarah Perencanaan Pembangunan* (Musrenbang) which have submitted requests in the form of infrastructure and training to maintain environmental quality in their respective areas. In addition, there are still several programs such as Proklim and Kampung Bersinar, as well as initiatives from the community itself to form thematic villages with environmental themes, such as waste-free villages, green villages, etc.

The Malang City Government has established a Musrenbang for Corporate Social Responsibility (CSR) as a bridge for companies wishing to participate in regional development. According to a planning analyst in charge of planning and funding, several CSR initiatives have actually addressed environmental issues, such as the rehabilitation of green open spaces in the form of parks. However, a leader at the Regional Development Planning Agency (Bappeda) stated that the implementation of CSR in the environmental sector is still not optimal. Companies in Malang City have not yet voluntarily distributed CSR in the environmental sector, indicating that corporate awareness is still low. The government still needs to be proactive in reminding and encouraging companies to distribute CSR in the environmental sector, for example, waste management. As additional information, the Malang City Government received CSR in the form of rehabilitation of temporary waste storage in 2024, after a lengthy negotiation process with several companies. Furthermore, a senior planner in charge of planning and funding revealed that the reason for the suboptimal environmental CSR in Malang City is that environmental issues are not very attractive to companies as CSR objects because they lack promotional value. So far, the creation and beautification of parks remains one of the most popular environmental CSR initiatives.

Analysts at the Environmental Service emphasized that the potential in the form of a number of communities and societies that have shown initiative and commitment to care for the environment has not been utilized by the Government by creating groups or work teams consisting of various stakeholders with multidisciplinary backgrounds. The reason is that Malang City does not yet have someone who can collaborate with various stakeholders to run various programs or actions to care for the environment synergistically. According to a senior planner in charge of planning and funding, "Until now there has been no official group that involves various stakeholders in maintaining environmental quality. This depends on the leaders in Malang City, if they have a high concern for the environment, then the community will be formed". In line with this, one of the leaders at Bapeda said, "The obstacle is more about how to coordinate it. We have the government, society, and institution, but they still move in a partial manner. This requires an orchestra to be able to run hand in hand, so that it can be more visible. Like an orchestra, in this case a conductor is also needed to

lead and provide direction, that is what does not exist yet".

The Government is Still Not Fully Ready to Realize a Green City in Malang City

Human resources are the main input for implementing government policies that support sustainable development programs (Chams & García-Blandón, 2019). The ASN Professionalism Index of Malang City in 2024 was 83.12, and was included in the high category. One component of the ASN Professionalism Index is competence. The higher the ASN competence, the more effective and efficient the implementation of policies will be.

In general, according to the associate planner, the human resources of civil servants (ASN) in Malang City are competent enough to implement environmental programs, but awareness is still lacking. In line with this, a planning analyst in charge of planning and funding added that awareness and concern for the environment among civil servants, especially leaders, is still lacking. The informant said, "The programs implemented by leaders are still not environmentally conscious. Leaders should be able to implement environmental programs at the level of their respective work units. At the very least, the easiest way is to have waste sorting bins in the office. Dry and wet waste can be sorted, and it would be better if there was a follow-up process by recycling the waste. In reality, in offices, even City Hall, as the center of the Malang City Government office, still does not provide and implement waste sorting. So from this it can be concluded that leaders in Malang City do not care about the environment."

Leadership is a key factor in the success of environmental policies (Kardoyo et al., 2020; Li & Zhuang, 2023). A senior planner in charge of planning and funding stated that civil servants (ASN) are highly dependent on and follow the decisions of their leaders. Therefore, leadership's concern for the environment will determine the implementation of environmental policies. If the initiative originates from subordinates without being welcomed by the leadership, the policy will not be implemented. However, based on information obtained from one of the Bappeda leaders, leaders in Malang City still do not consider the environment important because there are still no major problems currently.

An associate planner stated that environmental issues are still considered trivial, as the government's focus remains on visible issues. The principle of "as long as not in my backyard" encourages environmental issues to be put aside for now, as they are not immediately visible and have not yet become a primary public concern. Meanwhile, a Bappeda leader considers environmental innovations and policies in Malang City

to be high-risk. Failure to succeed will result in public criticism for wasting budget and resources. However, success also tends to receive little public attention. Consequently, politically, environmental policies are becoming less popular and sought after by leaders.

One of the Bappeda leaders stated that high-level meetings for monitoring and evaluating environmental performance are still partial, namely that meetings of leaders discussing the environment are only held when there are certain incidents that need to be addressed. A planning analyst in charge of planning and funding added that leaders rarely see evaluations of inhibiting and supporting factors for program success. This is what triggers the business as usual work pattern, because of the weak desire to fix something that is still lacking and maintain or improve what is already running well.

The planning system in Malang City, especially at the Regional Apparatus level, is still often found to implement business as usual. This is supported by the statement of a junior planner in charge of evaluation, who argued that planning in Malang City is still business as usual, namely that every year the desire is the same and there has been no breakthrough innovation. This means that from planning to program implementation, the Malang City Government tends to implement the same thing from time to time. In line with this statement, a senior planner in charge of infrastructure stated that the Regional Apparatus carries out its duties and functions, from the past to the present, the pattern tends to be the same, so that there are still very few efforts to innovate in forming a green system in the Government.

Furthermore, a planning analyst specializing in planning and funding stated that the budgeting process in Malang City is often guided by the previous year's budget, rather than based on development focus and priorities. Then, an associate planner said, "If we don't make out-of-the-box efforts or continue with business as usual, then money and resources will only be sucked up for routine matters." Therefore, it can be concluded that, with a business-as-usual work pattern and minimal innovation, the Malang City Government is becoming less effective and efficient in solving development problems.

In fact, regulations and policies in Malang City to support green city are already available, including waste management, green open space, green buildings, etc. The senior planner in charge of regional affairs said that the Malang City Government is still not progressive and brave enough in enforcing the regulations that have been set. In line with this statement, the associate planner also believes that the main cause of the less than optimal environmental conservation policy in Malang City is the weak enforcement of existing laws.

Meanwhile, the senior planner in charge of infrastructure also regretted a number of permits for several vertical buildings, such as apartments, which were not accompanied by adequate waste and garbage management systems and traffic management. In fact, when viewed from their locations, these vertical buildings are located around densely populated areas and educational centers that tend to be busier. This raises a separate question as to the extent to which the Environmental Impact Analysis (AMDAL) and Traffic Impact Analysis (ANDALALIN) are considered in the permits granted.

A senior planner in charge of infrastructure also stated that the Malang City Government's oversight of the permits issued remains weak. During the permit application process, buildings appear to have met the necessary requirements, but when construction begins, the permit recipients fail to adhere to the mandatory principles. Meanwhile, a junior planner in charge of evaluation highlighted the weak oversight of how companies manage their waste. A senior planner in charge of regional affairs stated that many industries in Malang City still dispose of waste into waterways, particularly micro- to medium-scale industries, such as the tempeh industry in Malang City.

From a planning perspective, Malang City has incorporated environmental elements into its Regional Development Vision and Mission. The vision of the Malang City Long-Term Regional Development Plan for 2025-2045 is "Realizing Malang City as a City of Quality, Cultured, and Environmentally Aware Education

Towards a Prosperous Society" with one of its missions being "Creating a Conducive City Environment as a City of Quality Education". Meanwhile, in the Final Draft of the Malang City RPJMD for 2025-2029, environmental issues are also part of the mission, which reads "Creating a Beautiful, Collaborative, Sustainable and Preserved Urban Environment".

Although environmental and sustainability issues are part of the regional development vision and mission, the Malang City Government has yet to translate them into a strategy. According to a planning analyst in charge of planning and funding, "environmental sustainability strategies are actually available in medium-term planning documents, but they are still macro and have not been outlined in more detail in Regional Government Work Plan/Rencana Kerja Pemerintah Daerah (RKPD) or the Local government agency work plan/ Rencana Kerja (Renja) Perangkat Daerah. The focus of planning in Malang City is still focused on determining indicators and performance targets. So, in the end, the strategy remains only a dream because there is no real action." A junior planner in charge of evaluation also stated the same thing: indicators and targets to measure environmental quality are available, but the Malang City Government does not yet have a strategy to achieve the targets of these indicators. Meanwhile, an associate planner said that environmental sustainability is always formally mentioned in planning, but it does not get to the root of the problem, so the planned strategy does not necessarily address existing problems.

Table 1. SWOT Matrix and Strategic Framework of Malang City Government towards Green City

	Strength (S)	Weakness (W)
	S1. Availability of regulations that support environmental sustainability S2. Adequate ASN competencies S3. Utilization of technology in providing public services and information	W1. Weak implementation of environmental policies and law enforcement W2. The work system still uses "Business as Usual" W3. The absence of cross-sectoral institution and stakeholders
Opportunity (O) O1. There are communities, organizations, community groups (including RT and RW), private sector, universities, and other stakeholders who can be involved in environmental policies. O2. The central government has many programs that support environmental sustainability.	SO Strategy 1. Involving the community as environmental supervisors (S1, S3, O1) 2. Optimization of CSR and research for the development of green resources, projects, and technologies (S2, S3, O1) 3. Cooperation with the Central Government for environmental programs (S2, S3, O2)	WO Strategy 1. Creating multidisciplinary working groups that cover the processes of planning, control, evaluation, publication, supervision, and enforcement of regulations (W1, W2, W3, O1)
Threat (T) T1. Social and economic dynamics such as urbanization, tourism, and investment	ST Strategy 1. Implementing green campaigns actively and massively (S3, T2)	WT Strategy 1. Application of rewards and punishments in the implementation

| T2. People's mindsets and habits are difficult to change | 2. Implementing a circular economy to attract public interest in participating in environmental programs (S1, S2, T2) | of environmental regulations/policies (W1, T1, T2)
 2. Open discussions with the community to convey transparency of environmental programs (W1, W3, T2)
 3. The government provides examples of environmental concern to increase public trust (W1, W2, T2) |

Green Knowledge and Green Awareness as Keys to the Success of the Malang City Government's Strategy to Become a Green City

Based on the information obtained from the sources, the strengths, weaknesses, opportunities, and threats of the Malang City Government can be classified as a basis for developing a strategic framework towards a green city. Alternative strategies can be implemented simultaneously because they are interrelated. The recommended strategies tend to be low-cost, but require a high level of commitment to implement.

A strategy that can serve as a foundation for realizing a green city is to create a multidisciplinary working group that encompasses the planning, control, evaluation, publication, monitoring, and enforcement processes. This is because urban environmental issues are complex, requiring collaboration and synergy from all stakeholders, including the government, community, private sector, academics, and the media (Nishant et al., 2020; Ummamah et al., 2024). By forming a multidisciplinary group consisting of various green city stakeholders, the goals and programs to be achieved and implemented are mutually agreed upon. Each stakeholder will carry out their respective roles based on predetermined tasks and functions to achieve these goals (Barker et al., 2024).

The perspectives of the government, society, and private sector in responding to environmental problems play an important role in realizing a green city. (Hadjichambis et al., 2022). Several studies have shown that green knowledge and green awareness are driving factors in creating pro-environmental behavior (Herdiansyah et al., 2022; Kousar et al., 2022; Liobikienė & Poškus, 2019; Liu et al., 2020; Mkumbachi et al., 2020). Good environmental awareness and knowledge can lead to concrete actions to protect and preserve the environment, with stronger awareness resulting in greater pro-environmental behavior (Handayani et al., 2021).

Government capacity is a key factor in determining the success of public policy (Bryson, 2011). The Malang City Government can collaborate with universities and the central government to provide environmental training and education for civil servants. Planning analysts specializing in planning and funding argue that sound environmental policies can be formed if civil servants possess a high level of environmental knowledge and awareness, especially leaders as policymakers. Therefore, environmental training and education are needed at every level and position in the Malang City Government.

Analysts at the Environmental Service said that the success of environmental policy programs depends on the community and the private sector, which are the biggest polluters. Therefore, environmental awareness possessed by the community and the private sector is very important in realizing a green city. Changes in the behavior of the community, private sector, and stakeholders towards the environment can be encouraged through the transfer of information and knowledge, one of which is through a green campaign that utilizes active, massive, and interactive social media (Najhalidi & Rosilawati, 2023). One of the leaders at Bappeda said that it is necessary to disseminate information to the community and the private sector to increase environmental awareness. This aims to increase public and private knowledge regarding the dangers of environmental degradation and to understand the role of environmental balance in life. The planner in charge of planning and funding added that environmental care events need to be held to increase public awareness, so that environmental programs run by the government can run effectively.

Government transparency regarding environmental policies will increase public trust in participating in pro-environmental programs (Izdebska & Knieling, 2021; Elander et al., 2005; Alcoforado et al., 2009). A senior planner specializing in infrastructure argued that the Mayor should hold a discussion forum to transparently communicate environmental programs and budget requirements to the public and provide an information portal that is accessible to anyone. Meanwhile, an analyst at the Environmental Agency stated that the Government itself must comply with environmental regulations and policies to increase public trust, because if the government, as the regulator, does not implement its policies, the public will not implement them either.

Furthermore, one paradigm frequently used to support sustainable development is the circular economy. A circular economy is an environmental

strategy that provides economic, environmental, and social benefits to communities and stakeholders (Padilla-Rivera et al., 2020; Borchers et al., 2014). According to an associate planner, "a circular economy is an innovation needed to increase public and private environmental awareness through economic incentives obtained for participation in the program."

The implementation of rewards and punishments is necessary to stimulate environmentally conscious practices by the public and private sector (Chenavaz & Dimitrov, 2024). An associate planner stated that the Malang City Government needs to implement rewards and punishments to force changes in the mindset and behavior of the public and private sector to comply with environmental regulations and policies. Meanwhile, a junior planner in charge of evaluation stated that law enforcement, along with rewards and punishments, will make environmental policies more effective.

After environmental awareness and knowledge grow and are formed in the community and private sector, several other programs or policies that support green cities can be developed. Senior planners in charge of planning and funding said that environmentally conscious communities can be utilized as environmental supervisors, if there is something that has the potential to damage the environment, they can report it to the Government through the complaint portal. Meanwhile, environmental awareness owned by the private sector is expected to increase CSR in the environmental sector, so that funding to run environmental programs and projects is greater. Opportunities for financing other environmental projects and programs can also be obtained from financial assistance from the Central Government. The commitment shown by local governments, communities, and stakeholders to the environment can increase the Central Government's trust in providing environmental program assistance.

Conclusion

The institutional role and readiness of the Malang City Government in supporting green cities are still suboptimal. This is because green city institution in Malang City have not yet been established, as the government, green communities, the community, and other stakeholders are still acting independently, resulting in partial and impractical implementation. Meanwhile, the government is also still not fully prepared to realize green cities due to a lack of awareness, weak law enforcement, and a conventional work system, from planning to evaluation. Strong commitment and collaboration among stakeholders are essential for realizing a green city in Malang. Stakeholders' green awareness and knowledge are key drivers for implementing the green city strategy in

Malang. Increasing green awareness and knowledge among the public and private sector can be achieved through green campaigns, policy transparency, a circular economy, and the implementation of rewards and punishments.

Author Contributions
All authors contributed equally to the writing of this.

Conflict of Interest
All authors declare that they have no conflict of interest.

References

Abdel-Basset, M., Mohamed, M., & Smarandache, F. (2018). An extension of neutrosophic AHP-SWOT analysis for strategic planning and decision-making. *Symmetry*, *10*(4). https://doi.org/10.3390/sym10040116

Alcoforado, M. J., Andrade, H., Lopes, A., & Vasconcelos, J. (2009). "Application of Climatic Guidelines to Urban Planning. The Example of Lisbon (Portugal)". *Landscape and Urban Planning, 90*(1-2), 56-65. https://doi.org/10.1016/j.landurbplan.2008.10.006

Barker, A., Garcia-Blanco, G., Garcia, I., & Aguirre-Such, A. (2024). The role of strategic planning in Nature-based Solutions transformation: an evaluation of the Green Cities Framework in mainstreaming Nature-based Solutions in 6 European countries. *Nature-Based Solutions*, *6*(6), 100157. https://doi.org/10.1016/j.nbsj.2024.100157

Borchers, C., Boesch, C., Riedel, J., Guilahoux, H., Ouattara, D., & Randler, C. (2014). Environmental education in Côte D'Ivoire/West Africa: Extra-curricular primary school teaching shows positive impact on environmental knowledge and attitudes. *International Journal of Science Education, 4*(3), 240–259. http://dx.doi.org/10.1080/21548455.2013.803632

Bryson, J. M. (2011). *Strategic Planning for Public and*

Nonprofit Organization. San Francisco: Wiley.

Chai, J., Wang, Z., & Yu, C. (2021). Analysis for the interaction relationship between urbanization and ecological security: A case study in wuhan city circle of china. *International Journal of Environmental Research and Public Health*, *18*(24). https://doi.org/10.3390/ijerph182413187

Chams, N., & García-Blandón, J. (2019). On the importance of sustainable human resource management for the adoption of sustainable development goals. *Resources, Conservation and Recycling*, *141*(10), 109–122. https://doi.org/10.1016/j.resconrec.2018.10.006

Chenavaz, R. Y., & Dimitrov, S. (2024). From waste to wealth: Policies to promote the circular economy. *Journal of Cleaner Production*, *443*(2). https://doi.org/10.1016/j.jclepro.2024.141086

Dall'O', G. (2020). *Green Planning for Cities and Communities*. Milan: Springer. https://doi.org/10.1007/978-3-030-41072-8_9

Dorst, H., van der Jagt, A., Raven, R., & Runhaar, H. (2019). Urban greening through nature-based solutions – Key characteristics of an emerging concept. *Sustainable Cities and Society*, *49*(1), 101620. https://doi.org/10.1016/j.scs.2019.101620

Elander, I., Lundgren, A. E., Malbert, B., & Sandström, U. G. (2005). "Biodiversity in Urban Governance and Planning: Examples from Swedish Cities". *Journal of Environmental Planning and Management, 6*(3), 283-301. https://doi.org/10.1080/14649350500208910

European Commission. (2015). *Towards an EU Research and Innovation Policy Agenda for Nature-based Solutions & Re-naturing Cities : Final Report of the Horizon 2020 Expert Group on 'Nature-based solutions and Re-naturing cities*. Retrieved from https://op.europa.eu/en/publication-detail/-/publication/fb117980-d5aa-46df-8edc-af367cddc202

Hadjichambis, A. C., Paraskeva-Hadjichambi, D., Sinakou, E., Adamou, A., & Georgiou, Y. (2022). Green Cities for Environmental Citizenship: A Systematic Literature Review of Empirical Research from 31 Green Cities of the World. *Sustainability (Switzerland)*, *14*(23). https://doi.org/10.3390/su142316223

Hall, M. H. P., & Balogh, S. B. (2019). *Understanding Urban Ecology: An Interdisciplinary Systems Approach*. Springer. https://doi.org/10.1007/978-3-030-11259-2_10

Handayani, W., Ariescy, R. R., Cahya, F. A., Yusnindi, S. I., & Sulistyo, A. (2021). Literature Review: Environmental Awareness and Pro-Environmental Behavior. *Nusantara Science and Technology Proceedings*, 170-173.

https://doi.org/10.11594/nstp.2021.0925

Herdiansyah, H., Sholihah, S. M. A., & Frimawaty, E. (2022). Environmental Awareness Based on Community Knowledge, Attitude, and Behavior of the Environmental Impact of Plastic Packaging Use in Urban Areas. *IOP Conference Series: Earth and Environmental Science*, *1111*(1), 6–13. https://doi.org/10.1088/1755-1315/1111/1/012030

Izdebska, O., & Knieling, J. (2021). Citizen involvement in waste management and circular economy in cities: Key elements for planning and implementation. *European Spatial Research and Policy*, *27*(2), 115–129. https://doi.org/10.18778/1231-1952.27.2.08

Kardoyo, K., Feriady, M., Farliana, N., & Nurkhin, A. (2020). Influence of the Green Leadership Toward Environmental Policies Support. *Journal of Asian Finance, Economics and Business*, *7*(11), 459–467. https://doi.org/10.13106/jafeb.2020.vol7.no11.459

Kooy, M., Furlong, K., & Lamb, V. (2020). Nature based solutions for urban water management in Asian cities: Integrating vulnerability into sustainable design. *International Development Planning Review*, *42*(3), 381–390. https://doi.org/10.3828/idpr.2019.17

Kousar, S., Afzal, M., Ahmed, F., & Bojnec, Š. (2022). Environmental Awareness and Air Quality: The Mediating Role of Environmental Protective Behaviors. *Sustainability (Switzerland)*, *14*(6), 1–20. https://doi.org/10.3390/su14063138

Li, X., & Zhuang, X. (2023). Eco-City Problems: Industry–City–Ecology, Urbanization Development Assessment in Resource-Exhausted Cities. *Sustainability*, *15*(1), 1–22. https://doi.org/10.3390/su15010166

Liobikienė, G., & Poškus, M. S. (2019). The Importance of Environmental Knowledge for Private and Public Sphere Pro-Environmental Behavior: Modifying the Value-Belief-Norm Theory. *Sustainability*, *11*(12), 1–19. https://doi.org/10.3390/su11123324

Liu, P., Teng, M., & Han, C. (2020). How does environmental knowledge translate into pro-environmental behaviors?: The mediating role of environmental attitudes and behavioral intentions. *Science of the Total Environment*, *728*, 138126. https://doi.org/10.1016/j.scitotenv.2020.138126

Mkumbachi, R. L., Astina, I. K., & Handoyo, B. (2020). Environmental awareness and pro-environmental behavior: A case of university students in Malang city. *Jurnal Pendidikan Geografi*, *25*(2), 161–169. https://doi.org/10.17977/um017v25i22020p161

Najhalidi, A. D., & Rosilawati, Y. (2023). Green

Campaign of the Gili Eco Trust in Forming Public Awareness about the Environment to Realize Gili Trawangan Zero Waste. *E3S Web of Conferences*, *444*. https://doi.org/10.1051/e3sconf/202344403022

Nishant, R., Kennedy, M., & Corbett, J. (2020). Artificial intelligence for sustainability: Challenges, opportunities, and a research agenda. *International Journal of Information Management*, *53*(1), 102104. https://doi.org/10.1016/j.ijinfomgt.2020.102104

Novita, A. A., Anggoro, D. D., Wahyudi, L. E., & Sholichin, M. (2024). The Sustainability of Ready to Drink Water: Local Government Preparedness in Malang, Indonesia. *Environment and Ecology Research*, *12*(2), 192–202. https://doi.org/10.13189/eer.2024.120210

Padilla-Rivera, A., Russo-Garrido, S., & Merveille, N. (2020). Addressing the social aspects of a circular economy: A systematic literature review. *Sustainability (Switzerland)*, *12*(19), 1–17. https://doi.org/10.3390/SU12197912

Rostin., Muthalib, A. A., Iswandi, R. M., Putera, A., Harafah, L. O. M., Aswad, N. H., Nur, M., Sutrisno., Koodoh, E. H., & Hasddin. (2023). Achievement of Performance and Evaluation of Green City Development Indicators for Sustainable Cities (SDGs) in 2030. *International Journal on Advanced Science, Engineering and Information Technology*, *13*(4), 1393–1403. https://doi.org/10.18517/ijaseit.13.4.18243

Salahudin, Nurmandi, A., & Jainuri. (2017). Urban Planning in Decentralization and Local Autonomy Era: A Case Study on the Relationship Between Local Government and Civic Group in Development and Budget Planning in Malang City (Indonesia). In *Management of Cities and Regions*. Intech. https://doi.org/10.5772/intechopen.70644

Shackleton, C. M., Cilliers, S. S., du Toit, M. J., & Davoren, E. (2021). The need for an urban ecology of the Global South. In *Urban ecology in the Global South* (pp. 1-26). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-67650-6_1

Sowińska-Świerkosz, B., & García, J. (2022). What are Nature-based solutions (NBS)? Setting core ideas for concept clarification. *Nature-Based Solutions*, *2*(5), 1–9. https://doi.org/10.1016/j.nbsj.2022.100009

Subadyo, A. T., Tutuko, P., & Jati, R. M. B. (2019). Implementation analysis of green city concept in Malang - Indonesia. *International Review for Spatial Planning and Sustainable Development*, *7*(2), 36–52. https://doi.org/10.14246/irspsd.7.2_36

Sugiyono. (2017). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.

Szyja, P. (2019). Green cities in Asia – Case studies. *Economics and Environment*, *2*(69), 117–131. https://doi.org/10.34659/2019/2/25

Ummamah, N., Martono, D. N., & Iskandar, K. (2024). Jakarta's Readiness for the Waste Reduction Program at the Source. *Jurnal Penelitian Pendidikan IPA*, *10*(SpecialIssue), 127–138. https://doi.org/10.29303/jppipa.v10ispecialissue.7936

United Nations. (2019). World Urbanization Prospects: The 2018 Revision. In *United Nations*. Retrieved from https://population.un.org/wup/Publications/Files/WUP2018-Report.pdf

Wikantiyoso, R., Tutuko, P., Suhartono, T., Sulaksono, A. G., & Safrilia, A. (2020). Green City MIS as a Sustainable Urban GOS Provision Control Implementation Model. *International Review for Spatial Planning and Sustainable Development*, *8*(1), 160–172. https://doi.org/10.14246/irspsda.8.1_160

Xu, D., Gao, J., Lin, W., & Zhou, W. (2021). Differences in the ecological impact of climate change and urbanization. *Urban Climate*, *38*(5). https://doi.org/10.1016/j.uclim.2021.100891

Zain, A. F. M., Pribadi, D. O., & Indraprahasta, G. S. (2022). Revisiting the Green City Concept in the Tropical and Global South Cities Context: The Case of Indonesia. *Frontiers in Environmental Science*, *10*(2), 1–14. https://doi.org/10.3389/fenvs.2022.787204

Zhang, L., Guo, S., Wu, Z., Alsaedi, A., & Hayat, T. (2018). SWOT analysis for the promotion of energy efficiency in rural buildings: A case study of China. *Energies*, *11*(4), 1–17. https://doi.org/10.3390/en11040851